

IN THE CLAIMS:

Please cancel claims 63-74.

Claim 1. (Original) A composition of matter, comprising:

a molecularly compact polymer-ligand conjugate capable of self-orienting on a surface, wherein said molecularly compact polymer comprises a fifth-generation (G5) polyamidoamine dendrimer having surface functional groups, wherein said surface functional groups comprise about 75% hydroxyl groups and about 25% primary amine groups, and wherein said ligand is selected from the group consisting of T-helper cell CD4 molecule, Fc receptor, Acetylcholine receptor (AChR), T cell receptor for antigen, insulin receptor, hormone receptor, antibodies, antibody fragments, IgG molecules, Fab antibody molecules, polypeptides, DNA fragments, RNA fragments, hormones, insulin, hCG, enzymes, sialic acid, porphyrins, and nucleotides, and wherein said ligand is bound to said molecularly compact polymer and said molecularly compact polymer binds to said surface such that said ligand is substantially uniformly positioned opposite said surface.

Claim 2. (Original) The composition of matter of claim 1, wherein said ligand is selected from the group consisting of IgG molecules and Fab antibody molecules.

Claim 3. (Original) The composition of matter of claim 1, wherein said surface is selected from the group consisting of immunoassay test strips, glass, nitrocellulose, paper, quartz, plastics, colloidal particles, metals, polymer latex beads, clays, ceramics, up-converting phosphorescent particles, and quantum dots.

Claim 4. (Original) The composition of matter of claim 3, wherein said colloidal particles are selected from the group consisting of colloidal gold, colloidal silver, and colloidal platinum.

Claim 5. (Original) The composition of matter of claim 4, wherein said colloidal gold particles have a diameter in the range of from about 10 nm to about 80 nm.

Claim 6. (Original) The composition of matter of claim 5, wherein said colloidal gold particles have a diameter in the range of from about 45 nm to about 65 nm.

Claim 7. (Original) The composition of matter of claim 3, wherein said quantum dots are nanometer sized inorganic particles.

Claim 8. (Original) The composition of matter of claim 7, wherein said quantum dots are selected from the group consisting of cadmium sulfide, cadmium selenide, and zinc sulfide.

Claim 9. (Original) The composition of matter of claim 1, wherein said G5 polyamidoamine dendrimer is of about 5.4 nm in diameter.

Claim 10. (Original) The composition of matter of claim 1, wherein said molecularly compact polymer-ligand conjugate is used on a lateral flow immunoassay test strip, said test strip having a membrane surface, a conjugate release pad, and an absorbent pad.

Claim 11. (Original) The composition of matter of claim 10, wherein said molecularly compact polymer-ligand conjugate is bound to a colloidal gold particle and is used as a reporter ligand on said conjugate release pad.

Claim 12. (Original) The composition of matter of claim 10, wherein said molecularly compact polymer-ligand conjugate is used as a capture ligand on said membrane surface.

Claim 13. (Original) A composition of matter, comprising:

a molecularly compact polymer-ligand conjugate capable of self-orienting on a surface, wherein said molecularly compact polymer comprises a sixth-generation (G6) to tenth-generation (G10) polyamidoamine dendrimer having surface functional groups, wherein said surface functional groups comprise greater than about 75% hydroxyl groups and less than about 25% primary amine groups, and wherein said ligand is selected from the group consisting of T-helper cell CD4 molecule, Fc receptor, Acetylcholine receptor (AChR), T cell receptor for antigen, insulin receptor, hormone receptor, antibodies, antibody fragments, IgG molecules, Fab antibody molecules, polypeptides, DNA fragments, RNA fragments, hormones, insulin, hCG, enzymes, sialic acid, porphyrins, and nucleotides, and wherein said ligand is bound to said molecularly compact polymer and said molecularly compact polymer binds to said surface such that said ligand is substantially uniformly positioned opposite said surface.

Claim 14. (Original) The composition of matter of claim 13, wherein said ligand is selected from the group consisting of IgG and Fab antibody molecules.

Claim 15. (Original) The composition of matter of claim 13, wherein said surface is selected from the group consisting of immunoassay test strips, glass, nitrocellulose, paper, quartz, plastics, colloidal particles, metals, polymer latex beads, clays, ceramics, up-converting phosphorescent particles, and quantum dots.

Claim 16. (Original) The composition of matter of claim 15, wherein said colloidal particles are selected from the group consisting of colloidal gold, colloidal silver, and colloidal platinum.

Claim 17. (Original) The composition of matter of claim 16, wherein said colloidal gold particles have a diameter in the range of from about 10 nm to about 80 nm.

Claim 18. (Original) The composition of matter of claim 17, wherein said colloidal gold particles have a diameter in the range of from about 45 nm to about 65 nm.

Claim 19. (Original) The composition of matter of claim 15, wherein said quantum dots are nanometer sized inorganic particles.

Claim 20. (Original) The composition of matter of claim 19, wherein said quantum dots are selected from the group consisting of cadmium sulfide, cadmium selenide, and zinc sulfide.

Claim 21. (Original) The composition of matter of claim 13, wherein said G6 to G10 polyamidoamine dendrimers have diameters of about 6.7 nm to about 13.8 nm.

Claim 22. (Original) The composition of matter of claim 13, wherein said molecularly compact polymer-ligand conjugate is used on a lateral flow immunoassay test strip, said test strip having a membrane surface, a conjugate release pad, and an absorbent pad.

Claim 23. (Original) The composition of matter of claim 22, wherein said molecularly compact polymer-ligand conjugate is bound to a colloidal gold particle and is used as a reporter ligand on said conjugate release pad.

Claim 24. (Original) The composition of matter of claim 22, wherein said molecularly compact polymer-ligand conjugate is used as a capture ligand on said membrane surface.

Claim 25. (Original) A composition of matter, comprising:

a molecularly compact polymer-ligand conjugate capable of self-orienting on a surface, wherein said molecularly compact polymer comprises a first-generation (G1) to second-generation (G2) polyamidoamine dendrimer having surface functional groups, wherein said surface functional groups comprise less than about 20% hydroxyl groups and greater than about 80% primary amine groups, and wherein said ligand is selected from the group consisting of T-helper cell CD4 molecule, Fc receptor, Acetylcholine receptor (AChR), T cell receptor for antigen, insulin receptor, hormone receptor, antibodies, antibody fragments, IgG molecules, Fab antibody molecules, polypeptides, DNA fragments, RNA fragments, hormones, insulin, hCG, enzymes, sialic acid, porphyrins, and nucleotides, and wherein said ligand is bound to said molecularly compact polymer and said molecularly compact polymer binds to said surface such that said ligand is substantially uniformly positioned opposite said surface.

Claim 26. (Original) The composition of matter of claim 25, wherein said ligand is selected from the group consisting of Fab antibody molecules and polypeptide molecules.

Claim 27. (Original) The composition of matter of claim 25, wherein said surface is selected from the group consisting of immunoassay test strips, glass, nitrocellulose,

paper, quartz, plastics, colloidal particles, metals, polymer latex beads, clays, ceramics, up-converting phosphorescent particles, and quantum dots.

Claim 28. (Original) The composition of matter of claim 27, wherein said colloidal particles are selected from the group consisting of colloidal gold, colloidal silver, and colloidal platinum.

Claim 29. (Original) The composition of matter of claim 28, wherein said colloidal gold particles have a diameter in the range of from about 10 nm to about 80 nm.

Claim 30. (Original) The composition of matter of claim 29, wherein said colloidal gold particles have a diameter in the range of from about 45 nm to about 65 nm.

Claim 31. (Original) The composition of matter of claim 27, wherein said quantum dots are nanometer sized inorganic particles.

Claim 32. (Original) The composition of matter of claim 31, wherein said quantum dots are selected from the group consisting of cadmium sulfide, cadmium selenide, and zinc sulfide.

Claim 33. (Original) The composition of matter of claim 25, wherein said G1 to G2 polyamidoamine dendrimers have a diameter of about 2.2 nm to about 2.9 nm.

Claim 34. (Original) The composition of matter of claim 25, wherein said molecularly compact polymer-ligand conjugate is used on a lateral flow immunoassay test strip, said test strip having a membrane surface, a conjugate release pad, and an absorbent pad.

Claim 35. (Original) The composition of matter of claim 34, wherein said molecularly compact polymer-ligand conjugate is bound to a colloidal gold particle and is used as a reporter ligand on said conjugate release pad.

Claim 36. (Original) The composition of matter of claim 34, wherein said molecularly compact polymer-ligand conjugate is used as a capture ligand on said membrane surface.

Claim 37. (Original) A composition of matter, comprising:

a molecularly compact polymer-ligand conjugate capable of self-orienting on a surface, wherein said molecularly compact polymer comprises a third-generation (G3) to fourth-generation (G4) polyamidoamine dendrimer having surface functional groups, wherein said surface functional groups comprise less than about 50% hydroxyl groups and greater than about 50% primary amine groups, and wherein said ligand is selected from the group consisting of T-helper cell CD4 molecule, Fc receptor, Acetylcholine receptor (AChR), T cell receptor for antigen, insulin receptor, hormone receptor, antibodies, antibody fragments, IgG molecules, Fab antibody molecules, polypeptides, DNA fragments, RNA fragments, hormones, insulin, hCG, enzymes, sialic acid, porphyrins, and nucleotides, and wherein said ligand is bound to said molecularly compact polymer and said molecularly compact polymer binds to said surface such that said ligand is substantially uniformly positioned opposite said surface.

Claim 38. (Original) The composition of matter of claim 37, wherein said ligand is selected from the group consisting of IgG molecules and Fab antibody molecules.

Claim 39. (Original) The composition of matter of claim 37, wherein said surface is selected from the group consisting of immunoassay test strips, glass, nitrocellulose, paper, quartz, plastics, colloidal particles, metals, polymer latex beads, clays, ceramics, up-converting phosphorescent particles, and quantum dots.

Claim 40. (Original) The composition of matter of claim 39, wherein said colloidal particles are selected from the group consisting of colloidal gold, colloidal silver, and colloidal platinum.

Claim 41. (Original) The composition of matter of claim 40, wherein said colloidal gold particles have a diameter in the range of from about 10 nm to about 80 nm.

Claim 42. (Original) The composition of matter of claim 41, wherein said colloidal gold particles have a diameter in the range of from about 45 nm to about 65 nm.

Claim 43. (Original) The composition of matter of claim 39, wherein said quantum dots are nanometer sized inorganic particles.

Claim 44. (Original) The composition of matter of claim 43, wherein said quantum dots are selected from the group consisting of cadmium sulfide, cadmium selenide, and zinc sulfide.

Claim 45. (Original) The composition of matter of claim 37, wherein said G3 to G4 polyamidoamine dendrimers have a diameter of about 3.6 nm to about 4.5 nm.

Claim 46. (Original) The composition of matter of claim 37, wherein said molecularly compact polymer-receptor conjugate is used on a lateral flow immunoassay test strip, said test strip having a membrane surface, a conjugate release pad, and an absorbent pad.

Claim 47. (Original) The composition of matter of claim 46, wherein said molecularly compact polymer-ligand conjugate is bound to a colloidal gold particle and is used as a reporter ligand on said conjugate release pad.

Claim 48. (Original) The composition of matter of claim 46, wherein said molecularly compact polymer-ligand conjugate is used as a capture ligand on said membrane surface.

Claim 49. (Original) A composition of matter, comprising:

a molecularly compact polymer-ligand conjugate capable of self-orienting on a surface, wherein said molecularly compact polymer comprises a fifth-generation (G5) polyamidoamine dendrimer having surface functional groups, wherein said surface functional groups comprise about 75% hydroxyl groups and about 25% primary amine groups, and wherein said ligand is selected from the group consisting of antibodies, antibody fragments, Fab antibody molecules, polypeptides, DNA fragments, RNA fragments, enzymes, sialic acid, porphyrins, nucleotides, and IgG molecules, and wherein said ligand is bound to said molecularly compact polymer and said molecularly compact polymer binds to said surface such that said ligand is substantially uniformly positioned opposite said surface, and wherein said surface comprises colloidal gold particles.

Claim 50. (Original) The composition of matter of claim 49, wherein said molecularly compact polymer-receptor conjugate is used on a lateral flow immunoassay test strip.

Claim 51. (Original) A composition of matter, comprising:

a molecularly compact polymer-ligand conjugate capable of self-orienting on a surface, wherein said molecularly compact polymer comprises a polyethyleneimine dendrigraft polymer and wherein said ligand is selected from the group consisting of T-helper cell CD4 molecule, Fc receptor, Acetylcholine receptor (AChR), T cell receptor for antigen, insulin receptor, hormone receptor,

antibodies, antibody fragments, IgG molecules, Fab antibody molecules, polypeptides, DNA fragments, RNA fragments, hormones, insulin, hCG, enzymes, sialic acid, porphyrins, and nucleotides, and wherein said ligand is bound to said molecularly compact polymer and said molecularly compact polymer binds to said surface such that said ligand is substantially uniformly positioned opposite said surface.

Claim 52. (Original) The composition of matter of claim 51, wherein said polyethyleneimine dendrigraft polymer comprises a generation 0 (G0) to generation 5 (G5) dendrigraft polymer.

Claim 53. (Original) The composition of matter of claim 52, wherein said polyethyleneimine dendrigraft polymer comprises a generation 3 (G3) dendrigraft.

Claim 54. (Original) The composition of claim 51, wherein said surface is selected from the group consisting of immunoassay test strips, glass, nitrocellulose, paper, quartz, plastics, colloidal particles, metals, polymer latex beads, clays, ceramics, up-converting phosphorescent particles, and quantum dots.

Claim 55. (Original) The composition of claim 54, wherein said colloidal particles are selected from the group consisting of colloidal gold, colloidal silver, and colloidal platinum.

Claim 56. (Original) The composition of matter of claim 55, wherein said colloidal gold particles have a diameter in the range of from about 10 nm to about 80 nm.

Claim 57. (Original) The composition of matter of claim 56, wherein said colloidal gold particles have a diameter in the range of from about 45 nm to about 65 nm.

Claim 58. (Original) The composition of matter of claim 54, wherein said quantum dots are nanometer sized inorganic particles.

Claim 59. (original) The composition of matter of claim 58, wherein said quantum dots are selected from the group consisting of cadmium sulfide, cadmium selenide, and zinc sulfide.

Claim 60. (Original) The composition of matter of claim 51, wherein said molecularly compact polymer-ligand conjugate is used on a lateral flow immunoassay test strip, said test strip having a membrane surface, a conjugate release pad, and an absorbent pad.

Claim 61. (Original) The composition of matter of claim 60, wherein said molecularly compact polymer-ligand conjugate is bound to a colloidal gold particle and is used as a reporter ligand on said conjugate release pad.

Claim 62. (Original) The composition of matter of claim 61, wherein said molecularly compact polymer-ligand conjugate is used as a capture ligand on said membrane surface.

Claims 63-74. (Canceled)